

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A computer-implemented method for processing data on a specific one node in a network comprising a plurality of nodes configured in a topology in which data, to reach an intended destination node, are transmitted through a configured node-to-node sequence, each of the nodes having a different node identifier that distinguishes the node from other nodes in the network, the method comprising:

receiving data packets at a first data packet on the specific one node, each received data packet being transmitted by a prior node in from a first direction through the configured node-to-node sequence and comprising a destination node identifier and a transmission round identifier indicating a transmission round of a prior node in which the data packet was sent; checking a destination identifier of the first data packet; for each received data packet,

i) if the transmission round identifier for the packet does not match a transmission round identifier for an immediately preceding received data packet, changing a first transit buffer round indicator for a first transit buffer in the specific one node;

ii) if the destination identifier for [[of]] the [[first]] data packet does not match the node identifier of the specific one node, storing the [[first]] data packet in [[a]] the first transit buffer for later transmission by the specific one node to another node in the first direction, the first data packet being stored with an assigned indicator of the current transit buffer round; and

iii) if the destination identifier of the [[first]] data packet matches the node identifier, processing the [[first]] data packet on the specific one node; to create a first processed data packet; and

~~storing data packets originating at the specific one node the first processed data packet in a first local buffer of the specific one node for later transmission by the specific one node to another node in the first direction; and~~

transmitting data packets from the specific one node in the first direction in successive transmission rounds, wherein in each successive transmission round there is transmitted i) one or more data packets from the first transit buffer that each have the same assigned transit buffer round identifier, if any data packets are present in the first transit buffer, and ii) one or more data packets from the first local buffer, if any data packets are present in the first local buffer.

2. (Canceled)

3. (Currently Amended) The computer-implemented method of claim 1 [[2]], wherein ~~checking a~~ the transmission round identifier of the ~~first~~ data packet includes checking a round bit in the ~~first~~ data packet.

4. (Currently Amended) The computer-implemented method of claim 1 [[2]], wherein changing [[a]] the first transit buffer round identifier ~~that is associated with the first transit buffer~~ includes changing a first transit buffer round that is associated with the first transit buffer if one or more data packets are already stored in the first transit buffer.

5. (Currently Amended) The computer-implemented method of claim 1, wherein the topology of the network method ~~comprises processing data on a node in a ring network.~~

6. (Original) The computer-implemented method of claim 1, wherein the method further comprises implementing congestion control when the first transit buffer is full.

7. (Currently Amended) The computer-implemented method of claim 1, wherein the method further comprises:

receiving data packets at a second data packet on the specific one node, each received data packet being transmitted by a prior node in from a second direction through the

configured node-to-node sequence and comprising a destination node identifier and a transmission round identifier indicating a transmission round of a prior node in which the data packet was sent;

checking a destination identifier of the second data packet;

for each data packet received in the second direction,

i) if the transmission round identifier for the packet does not match a transmission round identifier for an immediately preceding received data packet, changing a second transit buffer round indicator for the specific one node;

ii) if the destination identifier for [[of]] the [[second]] data packet does not match the node identifier of the specific one node, storing the [[second]] data packet in a second transit buffer for later transmission by the specific one node to another node in the second direction, the first data packet being stored with an assigned indicator of the current transit buffer round for the specific one node; and

iii) if the destination identifier of the [[second]] data packet matches the node identifier, processing the [[second]] data packet on the specific one node to create a second processed data packet; and

storing data packets originating at the specific one node and that are to be transmitted in the second direction the second processed data packet in a second [[first]] local buffer for later transmission by the node to another node in the second direction; and

transmitting data packets from the specific one node in the second direction in successive transmission rounds, wherein in each successive transmission round there is transmitted i) one or more data packets from the second transit buffer that each have the same assigned transit buffer round identifier, if any data packets are present in the second transit buffer, and ii) one or more data packets from the second local buffer, if any data packets are present in the second local buffer.

8. (Original) The computer-implemented method of claim 7, wherein the second direction is opposite to the first direction.

9. (Currently Amended) The computer-implemented method of claim 7, wherein the [[first]] data packets packet and the second data packet have a common size.

10. (Currently Amended) The computer-implemented method of claim 1, wherein processing the [[first]] data packet on the specific one node includes processing the [[first]] data packet on the specific one node using a segmentation and reassembly layer.

11. (Currently Amended) A computer-implemented method for processing data on a specific one node in a network comprising a plurality of nodes configured in a topology in which data, to reach an intended destination node, are transmitted through a configured node-to-node sequence, the method comprising:

determining if a first transit buffer on the specific one node is empty of received data packets that have not already been transmitted from the specific one node en route to the destination node, wherein the specific one node is configured to store in the first transit buffer ~~capable of holding one or more~~ all data packets that i) are received from another node of the network, ii) have a destination node that is a node other than the specific one node, and iii) are to be transmitted from the specific one node en route to the destination node in a first direction through the configured node-to-node sequence ~~destined for another node~~;

if the first transit buffer is determined to be empty, transmitting in the [[a]] first direction a data packet stored in a first local buffer, wherein the specific one node is configured to store in the first local buffer data packets originating from the specific one node that are to be transmitted to another node of the network in the first direction, and

if the first transit buffer is determined to be not empty, transmitting in the first direction one or more data packets stored in the first transit buffer if a first transmission condition is satisfied, wherein a determination of whether the first transmission condition is satisfied depends on information regarding a most recently transmitted data packet transmitted by the specific one node in the first direction, [[:]] and transmitting in the first direction a data packet stored in the first local buffer if the first transmission condition is not satisfied.

12. (Currently Amended) The computer-implemented method of claim 11, wherein transmitting in the [[a]] first direction a data packet stored in a first local buffer if the first

transit buffer is empty includes changing a transmission round associated with the transmitted data packet.

13. (Original) The computer-implemented method of claim 12, wherein changing a transmission round associated with the transmitted data packet includes changing a round bit in the transmitted data packet.

14. (Original) The computer-implemented method of claim 11, wherein data packets transmitted in the first direction have a common size.

15. (Original) The computer-implemented method of claim 11, wherein transmitting in a first direction a data packet stored in a first local buffer if the first transit buffer is empty includes transmitting one or more data packets stored in the first local buffer.

16. (Original) The computer-implemented method of claim 11, wherein transmitting in the first direction a data packet stored in the first local buffer if the first transmission condition is not satisfied includes changing a transmission round associated with the transmitted data packet.

17. (Original) The computer-implemented method of claim 11, wherein transmitting in the first direction a data packet stored in the first local buffer if the first transmission condition is not satisfied includes transmitting in the first direction a data packet stored in the first local buffer if the first local buffer contains one or more data packets.

18. (Original) The computer-implemented method of claim 11, wherein transmitting in the first direction one or more data packets stored in the first transit buffer if a first transmission condition is satisfied includes transmitting in the first direction one or more data packets stored in the first transit buffer if

a previous data packet transmitted in the first direction was empty, or
the previous data packet transmitted in first direction had been stored in the first local buffer, or

a transmission round associated with the previous data packet transmitted in first direction matches a transmission round of a first data packet stored in the first transit buffer.

19. (Currently Amended) The computer-implemented method of claim 11, wherein the topology of the network method comprises ~~processing data on a node in~~ a ring network.

20. (Currently Amended) The computer-implemented method of claim 11, wherein the method further comprises:

determining if a second transit buffer on the specific one node is empty of received data packets that have not already been transmitted from the specific one node en route to the destination node, wherein the specific one node is configured to store in the second transit buffer ~~capable of holding one or more~~ all data packets that i) are received from another node of the network, ii) have a destination node that is a node other than the specific one node, and iii) are to be transmitted from the specific one node en route to the destination node in a second direction through the configured node-to-node sequence ~~destined for another node;~~

if the second transit buffer is determined to be empty, transmitting in the [[a]] second direction a data packet stored in a second local buffer, wherein the specific one node is configured to store in the second local buffer data packets originating from the specific one node that are to be transmitted to another node of the network in the second direction, and

if the second transit buffer is determined to be not empty, transmitting in the second direction one or more data packets stored in the second transit buffer if a second transmission condition is satisfied, wherein a determination of whether the second transmission condition is satisfied depends on information regarding a most recently transmitted data packet transmitted by the specific one node in the second direction, [[:]] and transmitting in the second direction a data packet stored in the first local buffer if the second transmission condition is not satisfied.

21. (Original) The computer-implemented method of claim 20, wherein the second direction is opposite to the first direction.

22. (Currently Amended) A computer-implemented method for processing data between nodes in a distributed network configured in a topology in which data, to reach an intended destination node, are transmitted through a configured node-to-node sequence, the method comprising:

maintaining a set of local buffers and a set of transit buffers for each node in the distributed network, the set of local buffers for a given node being used for storing data originating at the given node, and the set of transit buffers for the given node being used for storing data received by the given node but destined for another node in the distributed network; and

using the local buffers and the transit buffers to process data between the nodes in processing cycles, wherein each node is capable of receiving data from another node, ~~and storing this data in one of its transit buffers during one processing cycle~~, and wherein each node transmits to another node, in each successive processing cycle, i) one or more data packets from the transit buffer that were each transmitted by a prior node in the same processing cycle, if any data packets are present in the first transit buffer, and ii) one or more data packets from the first local buffer, if any data packets are present in the first local buffer ~~is capable of transmitting data from one of its local buffers and from one of its transit buffers to another node during one processing cycle.~~

23. (Currently Amended) The computer-implemented method of claim 22, wherein each node is capable of ~~receiving data from another node~~, storing ~~[[this]]~~ received data in one of its transit buffers, and changing a transit buffer round associated with the transit buffer containing the stored data if a transmission round of the received data does not match a transmission round of previously received data.

24. (Original) The computer-implemented method of claim 22, wherein each node is capable of transmitting data from one of its local buffers and from one of its transit buffers to another node and changing a transmission round associated with the transmitted data.

25. (Currently Amended) The computer-implemented method of claim 22, wherein the topology of the network ~~method~~ comprises ~~processing data between nodes in a ring network.~~

26. (Original) The computer-implemented method of claim 22, wherein:

maintaining a set of local buffers and a set of transit buffers for each node in the distributed network includes maintaining at least two local buffers and at least two transit buffers for each node in the distributed network, such that each local buffer and each transit buffer is associated with a particular direction of data transmission.

27. (Currently Amended) A computer-readable medium having computer-executable instructions contained therein for performing a method, the method comprising:

receiving data packets at a first data packet on the specific one node, each received data packet being transmitted by a prior node in from a first direction through the configured node-to-node sequence and comprising a destination node identifier and a transmission round identifier indicating a transmission round of a prior node in which the data packet was sent;

checking a destination identifier of the first data packet;

for each received data packet.

i) if the transmission round identifier for the packet does not match a transmission round identifier for an immediately preceding received data packet, changing a first transit buffer round indicator for a first transit buffer in the specific one node;

ii) if the destination identifier for [[of]] the [[first]] data packet does not match the node identifier of the specific one node, storing the [[first]] data packet in [[a]] the first transit buffer for later transmission by the specific one node to another node in the first direction, the first data packet being stored with a transit buffer round indicator that equals the current first transit buffer round indicator for the first transit buffer; and

iii) if the destination identifier of the [[first]] data packet matches the node identifier, processing the [[first]] data packet on the specific one node; to create a first processed data packet; and

storing data packets originating at the specific one node the first processed data packet in a first local buffer of the specific one node for later transmission by the specific one node to another node in the first direction; and

transmitting data packets from the specific one node in the first direction in successive transmission rounds, wherein in each successive transmission round there is transmitted i) one or more data packets from the first transit buffer that each have the same assigned transit buffer round identifier, if any data packets are present in the first transit buffer, and ii) one or more data packets from the first local buffer, if any data packets are present in the first local buffer.

28. (Currently Amended) A computer-readable medium having computer-executable instructions contained therein for performing a method, the method comprising:

determining if a first transit buffer on the specific one node is empty of received data packets that have not already been transmitted from the specific one node en route to the destination node, wherein the specific one node is configured to store in the first transit buffer ~~capable of holding one or more~~ all data packets that i) are received from another node of the network, ii) have a destination node that is a node other than the specific one node, and iii) are to be transmitted from the specific one node en route to the destination node in a first direction through the configured node-to-node sequence ~~destined for another node;~~

if the first transit buffer is determined to be empty, transmitting in the [[a]] first direction a data packet stored in a first local buffer, wherein the specific one node is configured to store in the first local buffer data packets originating from the specific one node that are to be transmitted to another node of the network in the first direction, and

if the first transit buffer is determined to be not empty, transmitting in the first direction one or more data packets stored in the first transit buffer if a first transmission condition is satisfied, wherein a determination of whether the first transmission condition is satisfied depends on information regarding a most recently transmitted data packet transmitted by the specific one node in the first direction, [[:]] and transmitting in the first direction a data packet stored in the first local buffer if the first transmission condition is not satisfied.

29. (Currently Amended) A distributed network configured in a topology in which data, to reach an intended destination node, are transmitted through a configured node-to-node sequence, the network comprising:

a plurality of nodes that each have a set of local buffers and a set of transit buffers, the set of local buffers for each node being used for storing data originating at that node, and the set of transit buffers for each node being used for storing data received by that node but destined for another node in the distributed network;

wherein each node is configured to use the local buffers and the transit buffers to process data between the nodes in processing cycles;

wherein each node is capable of receiving data from another node; and storing this data in one of its transit buffers during one processing cycle;

wherein each node transmits to another node, in each successive processing cycle, i) one or more data packets from the transit buffer that were each transmitted by a prior node in the same processing cycle, if any data packets are present in the first transit buffer, and ii) one or more data packets from the first local buffer, if any data packets are present in the first local buffer is capable of transmitting data from one of its local buffers and from one of its transit buffers to another node during one processing cycle.

30. (New) The computer-implemented method of claim 11, wherein the first transmission condition is that each of the one or more data packets that is transmitted has the same transit buffer round identifier associated with the data packet.

31. (New) The computer-implemented method of claim 30, wherein each data packet received at the specific one node from another node is checked to determine if a transmission round identifier that identifies a transmission round of an immediately preceding node in which the data packet was transmitted has changed from a transmission round identifier of an immediately preceding data packet received from the immediately preceding node, and if there is a change, changing a current transit buffer round indicator for the specific one node.

32. (New) The computer-implemented method of claim 31, wherein the method further comprises, for each received data packet that is stored in the transit buffer of the specific one node, storing the received data packet in association with an identifier for the current transit buffer round of the specific one node.